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(54) TOWELS, TISSUES AND THE LIKE COMPRISING ENCAPSULATED COSMETICS

(71) We, L'OREAL, a French body Corporate of 14 Rue Royale, Paris, France, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed to be particularly described in and by the following statement:—

The present invention relates to towels, tissues and the like for cosmetic purposes.

Cosmetic makeup-removing or treating napkins (or towels) which are, for example, in the form of a sheet of an absorbent paper which possess a cleansing product are already known, although, unfortunately, sometimes this product can undergo a chemical change or stain adjacent objects over a period of time.

The aim of the present invention is to remedy these disadvantages quoted so as to permit the cosmetic makeup-removing and treating napkin to be stored practically indefinitely.

We have discovered according to the present invention how it is possible to prepare cosmetic makeup-removing or treating towels and the like which do not suffer from the disadvantages already mentioned. This can be achieved if the cosmetic products are micro-encapsulated and distributed within the support. Accordingly, the present invention provides a cosmetic composition suitable for application to the skin or hair, which comprises a flexible support in the form of a sheet, web, film or mat and, distributed therein, pressure-rupturable micro-capsules containing a liquid or semi/solid cosmetic skin or hair treatment preparation, the density of the micro-capsules being substantially equal to the density of the liquid suspension or solution from which the solid support is produced thus providing uniform distribution of the micro-capsules in the support.

According to the present invention the above-mentioned cosmetic compositions may be prepared by incorporating the micro-capsules containing the cosmetic agent during the

manufacture of the support while the latter is still in the form of a liquid solution or liquid dispersion, homogenising the mixture, if necessary with the addition of substances to adjust the density of the liquid suspension or solution so that it is substantially the same as that of the micro-capsules. The micro-capsules remain unchanged during this treatment. The composition mixture may, of course, be shaped before or during solidification.

According to a first method of preparation, a slurry of paper pulp is used as the starting material and micro-capsules, prepared beforehand, are incorporated into this slurry. The cosmetic composition can then be prepared in a similar manner to that employed for the preparation of an ordinary "blotting paper", but working under conditions which are compatible, on the one hand, with the cosmetic agent contained in the micro-capsules and, on the other hand, with the encapsulating material. Materials which possess especially good mechanical and heat resistance and a sufficient degree of elasticity are preferably chosen for forming the envelopes or walls of the micro-capsules.

According to a variant of the process, a synthetic polymer or copolymer which is either thermosetting or obtained by a catalytic process of polycondensation or polyaddition may be used as the support in place of the absorbent paper. However it is necessary to satisfy the following conditions during manufacture:

The monomers or prepolymers or the initial products of the polyaddition or polycondensation, which may be used as starting products, must be sufficiently fluid to allow easy introduction of the micro-capsules and good resulting homogenisation, the densities of the capsules and of the liquid phase being adjusted where appropriate. Homogenisation may be achieved by appropriate mixing, stirring, shaking or blowing in of a gas. The density of the liquid or suspension may then be adjusted (if necessary) to that of the micro-capsules by

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adding one or more components of the support, or an appropriate inert substance and, optionally, premixes containing the micro-capsules with a fraction of the support or one or more of its components. Thus, premixes of the liquid solution or dispersion containing the micro-capsules can be prepared and the premixes then combined.

The compounds forming the envelopes must have good heat resistance, for example to at least 50° to 60°C, and sufficient elasticity.

The envelopes must be chemically resistant to the action of the abovementioned liquid phase.

The final preparation of the synthetic polymer containing the micro-capsules can be carried out by means of a heat treatment or a catalytic treatment while observing the abovementioned conditions, so as to produce, depending on the polymer used, either thin films or sheets or a cellular material containing the cosmetic micro-capsules embedded therein. If one wishes to incorporate the micro-capsules into a thin sheet, it is advantageous to spray them onto the sheet before the polymerisation of this sheet is complete.

The value of the low density cosmetic compositions thus prepared is obvious; the micro-encapsulated cosmetic product can be made active by applying pressure, for example, finger pressure, to the composition over the area where it is desired to disperse it. It is also possible to obtain such a cosmetic composition directly.

The films in which the micro-capsules containing cosmetic makeup-removing and/or treating agents are advantageously incorporated into absorbent paper sheets having partitions, into which they are introduced as a single piece having the shape of the partition or as several, preferably lamellar pieces. It is thus possible to prepare cosmetic compositions having more than one active agent. Areas of the towel containing sheets incorporating a particular cosmetic agent can be coloured differently from areas containing different sheets.

According to another embodiment, the cosmetic composition of the invention is in the form of a sheet having a makeup-removing surface and a treating surface. In this case, the towel may be made of absorbent paper and comprise two partitions separated by an impermeable film, the two sides of which receive, respectively, the makeup-removing sheet and the treating sheet.

Suitable resins which may be used for the walls or envelopes of the micro-capsules include: polyamides, chlorinated polyethers, epoxide resins, polysulphones, silicones, urea-formaldehyde resin, polyurethanes, aromatic polyimides, mixed esters of cellulose or starch with dicarboxylic acids such as phthalic acid, succinic acid and maleic acid, polyvinylpyridines, polyvinylquinolines, polyvinylimidazoles, polyethylene, polypropylene, gelatine

treated with formaldehyde, or gum arabic. Numerous other types of resin can also be used, but the polyamides, the chlorinated polyethers, the epoxide resins and the polyalkylenes are preferred.

The materials used to prepare the synthetic resin films in which the micro-capsules may be incorporated include the following:

Acetal homopolymers and copolymers, methyl methacrylate homopolymer as well as copolymers formed with styrene and α -methylstyrene, ethylcellulose, cellulose acetate, cellulose propionate, cellulose acetobutyrate, vinyl polymers and copolymers such as vinylidene chloride and polyvinyl chloride, polystyrenes and styrene-acrylonitrile copolymers, allyl resins, resins based on casein, polyethylene, melamine-formaldehyde resin and phenol-formaldehyde resins.

The materials which may be used to form a cellular support include the following:

Polyurethane, cellulose acetate, urea-formaldehyde resins, polystyrene, styrene-acrylonitrile, polyvinyl chloride, polyethylene and epoxide resins. The apparent densities of these supports are generally 0.01 to 0.60, preferably 0.05 to 0.25 gms/cm³.

It will be appreciated that it is an essential characteristic of the process of the invention that the support material and encapsulating material be so chosen that they can withstand the manufacturing conditions, especially the heat conditions, it being possible for the active agent to be easily liberated by mechanical pressure at the time of use.

The micro-capsules may contain either makeup-removing products or other products for treating the epidermis, in the form of milks, oils, creams or emulsions, or makeup foundations or, generally, cosmetic products for local application such as gradual hair dyes, i.e. oxidation dyes which are capable of oxidation in the atmosphere or by oxidising agents such as hydrogen peroxide such as to produce colour gradually. Thus the composition may be a makeup-removing or treating composition, a skin softener or moisturiser, a sunscreen agent (sun oil) or an anti-wrinkle agent.

Typical embodiments of the present invention include the following:

The composition may be in the form of a makeup removing tissue, the support may be an unsized paper and the micro-capsules embedded therein suitably have a diameter from 50 to 100, especially 60 to 80, microns. The composition may comprise a film of synthetic resin having a thickness of 30 to 40 microns containing micro-capsules having a diameter from 1 to 40, preferably from 20 to 40, microns, which micro-capsules contain a cosmetic cream. Again, the composition may comprise a flexible cellular material, for example cellulosic wool, having an apparent density of from 0.01 to 0.60 containing micro-capsules of a foundation cream, the micro-

capsules having a diameter from 1 to 100 microns and the encapsulating material being polypropylene or polyethylene.

- 5 The following Examples, in which the parts and percentages are by weight, further illustrate the present invention. In these Examples, the walls of the micro-capsules account for 1 to 10%, particularly 3 to 6%, by weight of the micro-capsules.

10 EXAMPLE 1

A towel containing a micro-encapsulated makeup-removing milk.

The following makeup-removing composition is prepared:

15 "O.E." (oxyethylenated)	
stearyl alcohol	4.0
springy "Vaseline" (Registered Trade Mark)	6.0
isopropyl myristate	5.0
20 glycerine	10.0
anti-fermentation agent	0.1
perfume	0.3
water q.s.p.	100.0

- 25 This makeup-removing milk is thereafter micro-encapsulated in polypropylene, the micro-capsules having an average size of 50 to 100 microns, and particularly 60 to 80 microns. These micro-capsules are dispersed in a slurry of paper, the density of this slurry being
- 30 adjusted so that the micro-capsules are sufficiently uniformly distributed therein. This paper slurry is allowed to drain and then dried on a thin layer mould, optionally under slight pressure. The sheets are cut to the desired
- 35 size to provide ready-to-use makeup-removing towels. The micro-capsules liberate the makeup-removing milk on pressure being applied thus rupturing them.

EXAMPLE 2

- 40 Films cut into thin sheets containing a micro-encapsulated cream, the sheets being incorporated into cosmetic napkins, optionally comprising several partitions.

- 45 A cream is prepared which contains the following:

gum tragacanth	2.0
extra fine kaolin	30.0
titanium dioxide	3.0
cerebro-medullar extract	4.0
50 stabiliser	0.3
physiological serum	10.0
perfume	0.2
water q.s.p.	100.0

- 55 This cream is micro-encapsulated by means of a copolymer of styrene and a vinyl ester or ether, or other polymer which is soluble at an alkaline pH and insoluble at an acid pH, such as an acrylic acid polymer.

Micro capsules of size 1 to 100 microns, particularly 20 to 50 microns are obtained.

A mixture of cellulose acetobutyrate and the micro-capsules can be prepared, homogenised, and formed into thin films. During the homogenisation, the densities of the support and of the microcapsules were checked to confirm that they were the same.

After the evaporation of the solvent, a thin film containing the micro-capsules is obtained; this film, cut into sheets or into lamellae of the desired size and shape is incorporated into absorbent paper napkins which are provided with an envelope for receiving the sheets and which can have partitions forming several such envelopes.

EXAMPLE 3

A cosmetic cotton or napkin of a cellular material containing a micro-encapsulated makeup foundation.

A makeup foundation of the following composition is prepared:

styrene	5.0
isopropyl myristate	6.0
"Vaseline" (Registered Trade Mark) oil	20.0
glycerine stearate	3.0
propylene glycol	2.0
triethanolamine	2.0
preservative	0.2
titanium dioxide	10.0
carboxymethylcellulose	1.5
yellow iron oxide	2.0
red iron oxide	1.0
carbon black	0.3
demineralised water q.s.p.	100.0

This cream is micro-encapsulated by means of polypropylene or polyethylene, the size of the micro-capsules being from 1 to 100, particularly from 30 to 40 microns.

During the preparation of a cellular polyurethane resin, and before blowing in carbon dioxide gas (to homogenise and adjust the density), the micro-capsules obtained above, containing the makeup foundation cream are introduced.

After having achieved homogeneous distribution of the micro-capsules in the resin, the preparation of the cellular polymer is continued, the temperature and pressure conditions being adjusted appropriately. There-after the material is shaped and cut into cosmetic napkins or cottons.

During use, these preparations liberate on pressure crushing the micro-capsules, a colouring makeup foundation which spreads on the skin as desired by the user.

WHAT WE CLAIM IS:—

1. A cosmetic composition suitable for application to the skin or hair, which comprises a flexible support in the form of a sheet, web,

- film or mat and, distributed therein, pressure-rupturable micro-capsules containing a liquid or semi/solid cosmetic skin or hair treatment preparation, the density of the micro-capsules being substantially equal to the density of the liquid suspension or solution from which the solid support is produced, thus providing uniform distribution of the micro-capsules in the support.
2. A composition according to claim 1 wherein the encapsulated preparation is a make-up removing composition, a sun-oil, a face moisturising cream, a face foundation cream or a gradual hair dye composition.
3. A composition according to claim 1 or 2 wherein the encapsulating material is a polyamide, polycarbonate, chlorinated polyether, epoxy resin, polysulphone, silicone, polyurethane, aromatic polyimide, polyvinyl pyridine, polyvinyl quinoline, polyvinyl imidazole, polyethylene or polypropylene, a urea-formaldehyde resin, a mixed ester of cellulose or starch with a dicarboxylic acid, formaldehyde-treated gelatine or gum arabic.
4. A composition according to any one of claims 1 to 3 wherein the support is an absorbent unsized paper, a synthetic thermosetting polymer or copolymer, or a cellular material having closed or open cells in the form of a thin film, cellulosic wool or a cosmetic towel.
5. A composition according to any one of Claims 1 to 4 in the form of a make-up removing tissue, the support being an unsized paper having the micro-capsules, which have a diameter from 50 to 100 microns, embedded therein.
6. A composition according to Claim 5 wherein the micro-capsules have a diameter from 60 to 80 microns.
7. A composition according to any one of Claims 1 to 3 which comprises a film of synthetic resin having a thickness of 30 to 40 microns containing micro-capsules having a diameter from 1 to 40 microns, which micro-capsules contain a cosmetic cream.
8. A composition according to Claim 7 wherein the micro-capsules have a diameter from 20 to 40 microns.
9. A composition according to Claim 7 or 8 wherein the synthetic resin is an acetal homo- or co-polymer, a homopolymer, or a copolymer of methyl methacrylate with styrene or α -methyl styrene, ethyl cellulose, cellulose acetate, cellulose propionate, cellulose acetobutyrate, polyvinylidene chloride, polyvinylchloride, polystyrene, a styrene-acrylonitrile copolymer, an allyl resin, a casein-based resin, polyethylene, a polyester, a melamine-formaldehyde resin, a polyamide or a phenol-formaldehyde resin.
10. A composition according to any one of Claims 7 to 9 wherein the encapsulating material is a copolymer of styrene and a vinyl ester or ether, or an acrylic acid polymer.
11. A composition according to any one of Claims 7 to 10 which also comprises an unsized paper towel which surrounds the film.
12. A composition according to Claim 11 wherein the towel has a plurality of partitions each of which contains a strip of the film.
13. A composition according to any one of Claims 1 to 4 which comprises a flexible cellular material, as a support, having an apparent density from 0.01 to 0.60 containing micro-capsules of a foundation cream, the micro-capsules having a diameter from 1 to 100 microns, the micro-encapsulating material being polypropylene or polyethylene.
14. A composition according to Claim 13 wherein the cellular material has an apparent density from 0.05 to 0.25.
15. A composition according to Claim 13 or 14 wherein the micro-capsules have a diameter from 30 to 40 microns.
16. A composition according to any one of Claims 13 to 15 wherein the cellular material is a polyurethane, cellulose acetate, polystyrene, a urea-formaldehyde resin, a styrene-acrylonitrile copolymer, polyvinyl-chloride, polyethylene or an epoxy resin.
17. A composition according to any one of Claims 1 to 4 which comprises a support, one side of which contains micro-capsules containing a make-up removing composition and the other side of which contains a facial treating preparation.
18. A composition according to Claim 17 which comprises two layers of an unsized paper containing the micro-capsules, the two layers of paper being separated by an impermeable film.
19. A composition according to Claim 1 substantially as hereinbefore described.
20. A composition according to Claim 1 substantially as described in any one of the Examples.
21. Process for preparing a composition as claimed in any one of Claims 1 to 20 which comprises incorporating the micro-capsules into the support while the latter is still in the form of a liquid solution or liquid dispersion, homogenising the resulting mixture, if necessary with the addition of substances to adjust the density of the support in the solid state so that it is substantially the same as that of the micro-capsules.
22. Process according to Claim 21 in which the support is paper, the micro-capsules being introduced into a slurry of paper and, after homogenising the mixture, allowing it to drain and then drying it in thin layers, optionally with pressure insufficient to rupture the micro-capsules.
23. Process according to Claim 21 or 22 in which premixes of the liquid solution or dispersion containing the micro-capsules are prepared and the premixes are then combined.
24. Process for preparing a composition as claimed in any one of Claims 7 to 12 which

comprises introducing the micro-capsules into a solution of the synthetic resin, homogenising the mixture and spreading it into thin layers and evaporating the solvent, the resulting film optionally being cut and inserted into partitions in an unsized paper.

25. Process for preparing a composition as claimed in any one of Claims 13 to 16 which comprises introducing the micro-capsules into liquid resin, blowing an inert gas therethrough so as to homogenise the mixture and then producing a cellular material therefrom in known manner.

26. Process according to any one of Claims 21 to 25 wherein the density of the micro-capsules is approximately the same as that of the support when in liquid form.

27. Process according to any one of Claims 21 to 26 substantially as hereinbefore described.

28. Process according to any one of Claims

21 to 26 substantially as described in any one of the Examples.

29. A composition as defined in any one of Claims 1 to 20 whenever prepared by a process as claimed in any one of Claims 21 to 28.

30. A method of applying a cosmetic composition to the skin or hair in which a composition as claimed in any one of Claims 1 to 20 and 29 is placed in contact with the skin or hair and then sufficient pressure is applied to the composition to cause the micro-capsules to rupture.

31. A method according to Claim 30 substantially as hereinbefore described.

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